

REMARKS

The Applicants respectfully request reconsideration of the present application in view of the reasons that follow.

No claim is amended. Claims 1-38 are currently pending for examination.

I. Information Disclosure Statement (IDS)

Applicants thank the Office for acknowledging the IDS submitted on April 9, 2010.

II. Claim Rejections Under 35 U.S.C. §103 Over Halas And Azamian

Claims 1-3, 7-33 and 36-38 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Halas et al., US 6,778,616 (“Halas”) in view of Azamian et al., *Chem. Commun.*, 2002, 366-367 (“Azamian”). Applicants respectfully traverse these rejections for at least the reasons that follow.

The Office Action correctly acknowledges that “Halas does not teach providing chromophores attached to defect sites (Office Action, Page 2, Item 5).” However, the Action points to the first column and figures of Azamian and alleges that “it would be obvious to one of ordinary skill in the art at the time of the invention to provide covalent bonding of single walled nanotubes to metal nanoparticles through defect sites, as taught by Azamian, in the optical device of Halas in order to enhance electrical and optical properties by development of low resistance Ohmic contacts advantageous for nanoelectronic applications (Office Action, Page 3, Item 7).” Applicants respectfully disagree.

Azamian teaches to covalently bind gold nanoparticles to single walled carbon nanotubes. It, however, merely asserts that “metal-nanotube interactions are of considerable importance in the development of low resistance Ohmic contact to these structures,” without teaching or suggesting that a low resistance Ohmic contact to the nanotubes can be established by

functionalizing the nanotubes with gold nanoparticles. Furthermore, Azamian is completely silent regarding improving optical properties of the nanotubes, in contrast to what is alleged in the Office Action (Office Action, Page 3, Item 7).

Halas is directed to chemical sensors based on surface enhanced Raman scattering (Halas, Column 1, Lines 29-44). Halas further explains that a composite of semiconducting carbon nanotubes and nanoparticles can be used for high temperature operation (Halas, Column 4, Lines 3-5). As correctly acknowledged by the Office Action, Halas does not teach attaching nanoparticles to the defect sites (Office Action, Page 2, Item 5). Rather, Halas merely suggests that the combination for high temperature operation may comprise carbon nanotubes and nanoparticles in the form of a mixture.

Applicants respectfully submit that the *surface enhanced Raman scattering* at high temperature operation, for which Halas uses the composite comprising semiconducting carbon nanotubes and nanoparticles (Halas, Column 4, Lines 3-5), is ***not a nanoelectronic device where a low resistance Ohmic contact is provided***. In other words, the Ohmic contacts allegedly provided by Azamian invention would ***not*** necessarily provide any benefits to the surface enhanced Raman scattering application that Halas is directed to. One of ordinary in the art would therefore ***not*** be motivated to improve the low resistance Ohmic contacts of the nanotubes of Halas, in contrast to what is asserted in the Office Action. The references fail to establish a *prima facie* case of obviousness.

Accordingly, Applicants respectfully request withdrawal of the section 103 rejections over Halas and Azamian.

III. Claim Rejections Under 35 U.S.C. §103 Over Halas, Azamian And Neuschafer

Claims 4-6 and 34-35 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Halas in view of Azamian, further in view of Neuschafer et al., US 6,078,705

(“Neuschafer”). Applicants respectfully traverse these rejections for at least the reasons that follow.

As explained above, the independent claims are patentable over Halas and Azamian. Neuschafer is cited for disclosing other features recited in dependent claims 4-6 and 34-35, but fails to cure the above-explained deficiencies of Halas and Azamian. Therefore, claims 4-6 and 34-35 are patentable for at least the same reasons as the respective base claims thereof.

Furthermore, claims 4-6 and 34-35 are separately patentable, as one of ordinary skill in the art would not have had a reason to combine the teachings of Halas and/or Azamian with those of Neuschafer. Specifically, Neuschafer teaches a sensor platform with dyes not bound or attached to any particularly entity. The Office has not established any evidence that one of ordinary skill in the art would have had any reason to attach the dyes of Neuschafer to the nanoparticles or the nanotubes of Halas. Moreover, to the extent that Halas’ teachings permit functionalizing the nanoparticles with another molecule, the molecule, such as para-mercaptoaniline, must exhibit a “strong Raman response,” (Halas, Column 3, Lines 63-67). The Office has not established any evidence that the dye of Neuschafer exhibits a response, and the PSF dye of Neuschafer is clearly not the same as the para-mercaptoaniline of Halas. A *prima facie* obviousness is not established, and thus claims 4-6 and 34-35 are separately patentable.

Accordingly, Applicants respectfully request withdrawal of section 103 rejections over Halas and Azamian further in view of Neuschafer.

CONCLUSION

The Applicants believe that the present application is now in condition for allowance and respectfully request favorable reconsideration of the application.

The Office is invited to contact the undersigned by telephone if a telephone interview would advance the prosecution of the present application.

The Office is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, the Applicants hereby petition for such extension under 37 C.F.R. § 1.136 and authorize payment be charged to Deposit Account No. 19-0741.

Respectfully submitted,

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